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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES  
Docket No. 17459US03

IN THE APPLICATION OF:

Michael C. Lewis, et al.

SERIAL NO.: 10/824,904

FILED: April 14, 2004

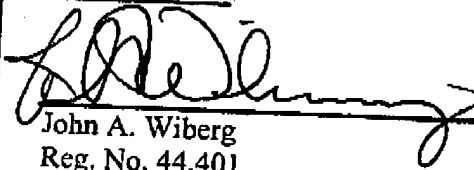
FOR: METHOD AND SYSTEM FOR  
REDUCING OVERFLOWS IN A  
COMPUTER GRAPHICS SYSTEM

ART UNIT: 2173

EXAMINER: Alvin H. Tan

Conf. No.: 7595

*The undersigned hereby certifies that this Appeal  
Brief is being transmitted to the United States  
Patent and Trademark Office via facsimile on  
January 25, 2010.*

  
John A. Wiberg  
Reg. No. 44,401

## BRIEF ON APPEAL

Mail Stop: Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This is an appeal from an Office Action dated January 23, 2009, in which claims 1, 13, 25 and 32-46 were finally rejected.

## REAL PARTY IN INTEREST

Broadcom Corporation, a corporation organized under the laws of the state of California, and having a place of business at 5300 California Avenue, Irvine, California 92617, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor, as set forth in the Assignment recorded at Reel 011572, Frame 0759 in the PTO assignment search room.

### **RELATED APPEALS AND INTERFERENCES**

There currently are no appeals pending regarding related applications.

### **STATUS OF THE CLAIMS**

Claims 1, 13, 25 and 32-46 are pending in the present application. Claims 2-12, 14-24 and 26-31 were previously cancelled. Pending claims 1, 13, 25 and 32-46 stand rejected and are the subject of this appeal.

### **STATUS OF THE AMENDMENTS**

There are no amendments pending or submitted herewith.

### **SUMMARY OF CLAIMED SUBJECT MATTER**

Claim 1 is directed to a method for providing a graphical image on a display of a system. The graphical image is provided from data describing a plurality of primitives. Pursuant to the method, the primitives are stored in a plurality of bins. The capacity of one or more of the bins is adjusted based on the ability of the system to process the primitives of a given bin in parallel. The primitives are then rendered by rendering each of the plurality of bins, bin by bin.

The invention as set forth in claim 1 is described throughout the Specification. For example, page 12, line 7 – page 14, line 12, referring to Figures 5a, 5b and 5c teach storing the primitives in a plurality of bins, adjusting the capacity of one or more of the bins based on the ability of the system to process the primitives of a given bin in parallel, and rendering the primitives by rendering each of the plurality of bins, bin by bin. The invention as set forth in claim 1 is also described in other parts of the Specification, such as, for example, in the Summary of the Invention section.

Claims 32 and 33 are dependent upon claim 1.

Claim 13 is directed to a computer-readable medium containing a program for providing a graphical image on a display of a system, the graphical image being provided from data describing a plurality of primitives. The program includes instructions for: (a) storing the plurality of primitives in a plurality of bins; (b) adjusting the capacity of one or more of the bins based on the ability of the system to process the primitives of a given bin in parallel; and (c) rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.

The invention as set forth in claim 13 is described throughout the Specification. For example, page 12, line 7 – page 14, line 12, referring to Figures 5a, 5b and 5c teach storing the primitives in a plurality of bins, adjusting the capacity of one or more of the bins based on the ability of the system to process the primitives of a given bin in parallel, and rendering the primitives by rendering each of the plurality of bins, bin by bin. The invention as set forth in claim 13 is also described in other parts of the Specification, such as, for example, in the Summary of the Invention section.

Claims 35 and 36 are dependent upon claim 13.

Claim 25 is directed to a system for providing a graphical image on a display. The graphical image is provided from data describing a plurality of primitives. The system includes a plurality of bins operable to store the plurality of primitives, and means for rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin. The capacity of one or more of the bins can be adjusted based on the ability of the system to process the primitives of a given bin in parallel.

The invention as set forth in claim 25 is described throughout the Specification. For example, page 12, line 7 – page 14, line 12, referring to Figures 5a, 5b and 5c teach storing the primitives in a plurality of bins, adjusting the capacity of one or more of the bins based on the ability of the system to process the primitives of a given bin in parallel, and rendering the primitives by rendering each of the plurality of bins, bin by bin. The invention as set forth in claim 25 is also described in other parts of the Specification, such as, for example, in the Summary of the Invention section.

Claims 38 and 39 are dependent upon claim 25.

Claim 34 is directed to a method for providing a graphical image on a display of a system. The graphical image is provided from data describing a plurality of primitives. Pursuant to the method, the primitives are stored in a plurality of bins. Bins or portions

are combined during operation of the system. The primitives are then rendered by rendering each of the plurality of bins, bin by bin.

The invention as set forth in claim 34 is described throughout the Specification. For example, page 12, line 7 – page 14, line 12, referring to Figures 5a, 5b and 5c teach storing primitives in a plurality of bins, combining bins or portions during operation of the system, and rendering the primitives by rendering each of the plurality of bins, bin by bin. The invention as set forth in claim 34 is also described in other parts of the Specification, such as, for example, in the Summary of the Invention section.

Claims 43 and 44 are dependent upon claim 34.

Claim 37 is directed to a computer-readable medium containing a program for providing a graphical image on a display of a system, the graphical image being provided from data describing a plurality of primitives. The program includes instructions for: (a) storing the plurality of primitives in a plurality of bins; (b) combining bins or portions of bins during operation of the system; and (c) rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.

The invention as set forth in claim 37 is described throughout the Specification. For example, page 12, line 7 – page 14, line 12, referring to Figures 5a, 5b and 5c teach storing primitives in a plurality of bins, combining bins or portions during operation of the system, and rendering the primitives by rendering each of the plurality of bins, bin by bin. The invention as set forth in claim 37 is also described in other parts of the Specification, such as, for example, in the Summary of the Invention section.

Claims 45 and 46 are dependent upon claim 37.

Claim 40 is directed to a system for providing a graphical image on a display. The graphical image is provided from data describing a plurality of primitives. The system includes a plurality of bins operable to store the plurality of primitives. The capacity of one or more of the bins can be adjusted during operation of the system. The system further includes means for combining bins or portions of bins, and means for rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.

The invention as set forth in claim 40 is described throughout the Specification. For example, page 12, line 7 – page 14, line 12, referring to Figures 5a, 5b and 5c teach storing primitives in a plurality of bins, combining bins or portions during operation of the system, and rendering the primitives by rendering each of the plurality of bins, bin by

bin. The invention as set forth in claim 40 is also described in other parts of the Specification, such as, for example, in the Summary of the Invention section.

Claims 41 and 42 are dependent upon claim 40.

#### **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

I. Claims 1, 13, 25 and 32-46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,424,345 issued to Wade K. Smith, et al. and U.S. Patent 6,191,800 issued to Robert T. Arenburg, et al.

## ARGUMENT

**I. Claims 1, 13, 25 and 32-46 are not unpatentable under 35 U.S.C. § 103(a) over Smith, et al. (US 6,424,345) and Arenburg, et al. (US 6,191,800).**

In the Office Action of January 23, 2009, the Examiner rejected claims 1, 13, 25 and 32-46 under 35 U.S.C. § 103(a) as being unpatentable over by Smith, et al. (US 6,424,345) and Arenburg, et al. (US 6,191,800). 35 U.S.C. 103(a) states:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

The Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), laid out the standard of patentability to be applied in obviousness rejections, stating:

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art references.<sup>1</sup> Additionally, in order to establish *prima facie* obviousness by combining two or more references, there must have been, at the time the invention was made by the applicant, some suggestion or motivation to combine the references.<sup>2</sup> The teaching or suggestion to make the claimed combination must be found in the prior art, and not based on the applicant's disclosure.<sup>3</sup> The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.<sup>4</sup>

<sup>1</sup> *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

<sup>2</sup> *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006).

<sup>3</sup> *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

<sup>4</sup> See MPEP § 2142, citing, e.g., *In re Rinehart*, 531 F.2d 1048 (CCPA 1976).

The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in *KSR International Co. v. Teleflex Inc.*, noted that the analysis supporting a rejection under 35 U.S.C. § 103 should be made explicit.<sup>5</sup> The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."<sup>6</sup>

A. Claims 1, 13, 25, 32, 33, 35, 36, 38 and 39 is not anticipated under 35 U.S.C. § 103(a) by Smith, et al. (US 6,424,345) and Arenburg, et al. (US 6,191,800).

Claim 1 is directed to:

1. A method for providing a graphical image on a display of a system, the graphical image being provided from data describing a plurality of primitives, the method comprising:
  - (a) storing the plurality of primitives in a plurality of bins;
  - (b) adjusting the capacity of one or more of the bins based on the ability of the system to process the primitives of a given bin in parallel; and
  - (c) rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.

Thus, claim 1 indicates that the capacity of one or more of the bins is adjusted based on the ability of the system to process the primitives of a given bin in parallel. The Examiner acknowledges that Smith fails to teach this aspect of claim 1. But the Examiner states that Arenburg teaches dividing a viewable area of a display into a plurality of tiles and adjusting sizes of tiles. The Examiner further asserts that Arenburg does this in order to better manage graphic workloads. The Examiner goes on to assert, "Since Smith teaches rendering a graphical image on a display system, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the sizes of tiles to balance graphics workload, as taught by Arenburg."<sup>7</sup> But even

<sup>5</sup> 82 USPQ2d 1385, 1396 (2007)

<sup>6</sup> *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), and *KSR v. Teleflex*, 82 USPQ2d at 1396 (quoting Federal Circuit statement with approval).

<sup>7</sup> Office Action dated January 23, 2009, page 3.

if this were true, it still would not result in a method that “adjust(s) the capacity of one or more of the bins based on the ability of the system to process the primitives of a given bin in parallel,” per claim 1. Neither Smith nor Arenburg teach this limitation of claim 1.

Perhaps the Examiner means to assert that Arenburg teaches adjusting tile sizes *based on* graphics workloads, and believes that such a teaching would satisfy claim 1’s adjusting of the capacity of one or more bins based on the ability of the system to process the primitives of a given bin in parallel. If this is the case, Appellant would firstly submit that Arenburg does not, in fact, teach adjusting tile sizes *based on* graphics workloads. At best, the balancing of workloads is simply a stated goal of the Arenburg disclosure. There is a big difference between a general goal of balancing workloads and an actual operation of “adjusting the capacity of one or more of the bins *based on* the ability of the system to process the primitives of a given bin in parallel.” Therefore, the combination of Smith and Arenburg fails to yield the invention of claim 1. Furthermore, even if Arenburg *did* teach adjusting tile sizes based on graphics workloads (it doesn’t), this still would not constitute “adjusting the capacity of one or more of the bins based on *the ability of the system to process the primitives of a given bin in parallel.*” That is, a teaching of basing an adjustment on graphics workloads would not teach basing an adjustment on the ability of the system to process the primitives of a given bin in parallel. Neither Smith nor Arenburg teach adjusting *anything* based on the ability of the system to process the primitives of a given bin in parallel. As mentioned previously, to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art references.<sup>8</sup> Because all of the limitations of claim 1 are not taught or suggested by Smith and Arenburg, claim 1 is patentable over those references.

Furthermore, the Examiner fails to provide a clear articulation of the reasons why it would have been obvious for one of skill in the art to combine the Smith and Arenburg references, as required by Federal Circuit and Supreme Court precedent. As stated previously, rejections based on obviousness “cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”<sup>9</sup> The Examiner’s only

<sup>8</sup> *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

<sup>9</sup> *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), and *KSR v. Teleflex*, 82 USPQ2d at 1396 (quoting Federal Circuit statement with approval).



rationale for combining Smith and Arenburg is, "Since Smith teaches rendering a graphical image on a display system, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the sizes of tiles to balance graphics workload, as taught by Arenburg."<sup>10</sup> This sentence merely regurgitates what the Examiner alleges to be taught by the individual Smith and Arenburg references. It does not articulate a rationale why one of skill in the art would combine the references in the manner suggested by the Examiner. Therefore, this sentence does not carry the Examiner's burden of establishing a *prima facie* case of obviousness. This is further reason why claim 1 is not obvious in view of Smith and Arenburg.

For the above reasons, Appellant submits that claim 1 and claims 32 and 33 depending therefrom, are patentable over Smith and Arenburg.

Independent claims 13 and 25 include limitations similar to those included in claim 1 and were rejected under identical grounds.<sup>11</sup> Appellant submits that claims 13 and 25, and claims 35, 36, 38 and 39 depending therefrom, are patentable over Smith and Arenburg for the reasons set forth above with respect to claim 1.

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<sup>10</sup> Office Action dated January 23, 2009, page 3.

<sup>11</sup> *Id.*

B. Claims 34, 37, and 40-46 is not anticipated under 35 U.S.C. § 103(a) by Smith, et al. (US 6,424,345) and Arenburg, et al. (US 6,191,800).

Claim 34 is directed to:

34. A method for providing a graphical image on a display of a system, the graphical image being provided from data describing a plurality of primitives, the method comprising:
- (a) storing the plurality of primitives in a plurality of bins;
  - (b) combining bins or portions of bins during operation of the system; and
  - (c) rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.

Thus claim 34 includes an operation of "combining bins or portions of bins during operation of the system." The Examiner acknowledges that Smith fails to teach this aspect of claim 34.<sup>12</sup> The Examiner asserts that Figures 3A and 3B of Arenburg show combining bins or portions of bins.<sup>13</sup> The Examiner supports this assertion by saying Figure 3A shows three tiles and Figure 3B shows three tiles after their sizes have been adjusted.<sup>14</sup> Appellant respectfully submits that adjusting the size of a tile or tiles is completely different than combining them. Appellant submits neither Smith nor Arenburg teach this aspect of claim 34. As mentioned previously, to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art references.<sup>15</sup> Because all of the limitations of claim 1 are not taught or suggested by Smith and Arenburg, claim 34 is patentable over those references.

Furthermore, the Examiner fails to provide a clear articulation of the reasons why it would have been obvious for one of skill in the art to combine the Smith and Arenburg references, as required by Federal Circuit and Supreme Court precedent. As stated previously, rejections based on obviousness "cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."<sup>16</sup> The Examiner's only

<sup>12</sup> *Id.* at page 4.

<sup>13</sup> *Id.* at pages 4-5.

<sup>14</sup> *Id.* at pages 4-5.

<sup>15</sup> *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

<sup>16</sup> *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), and *KSR v. Teleflex*, 82 USPQ2d at 1396 (quoting Federal Circuit statement with approval).

rationale for combining Smith and Arenburg is, "Since Smith teaches rendering a graphical image on a display system, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the sizes of tiles to balance graphics workload, as taught by Arenburg."<sup>17</sup> This sentence merely regurgitates what the Examiner alleges to be taught by the individual Smith and Arenburg references. It does not articulate a rationale why one of skill in the art would combine the references in the manner suggested by the Examiner. Therefore, this sentence does not carry the Examiner's burden of establishing a *prima facie* case of obviousness. This is further reason why claim 34 is not obvious in view of Smith and Arenburg.

For the above reasons, claim 34, and claims 43 and 44 depending therefrom, are allowable over the tandem of Smith and Arenburg.

Independent claims 37 and 40 include limitations similar to those included in claim 34 and were rejected under identical grounds.<sup>18</sup> Appellant submits that claims 37 and 40, and claims 41, 42, 45 and 46 depending therefrom, are patentable over Smith and Arenburg for the reasons set forth above with respect to claim 34.

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<sup>17</sup> Office Action dated January 23, 2009, page 5.

<sup>18</sup> *Id.* at pages 4-5.

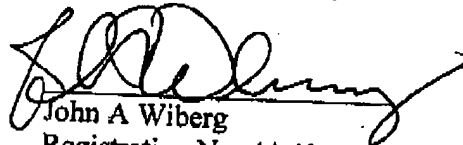
## II. Conclusion

For at least the foregoing reasons, Appellant submits that claims 1, 13, 25 and 32-46 are patentable over Smith and Arenburg. Reversal of the Examiner's rejection and issuance of a patent on the application are therefore requested.

The Commissioner is hereby authorized to charge \$540 (to cover the Brief on Appeal Fee of \$540) and any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Account No. 13-0017.

Dated: January 25, 2010

Respectfully submitted,



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**APPENDIX**

(37 C.F.R. § 1.192(c)(9))

The following claims are involved in this appeal:

1. A method for providing a graphical image on a display of a system, the graphical image being provided from data describing a plurality of primitives, the method comprising:
  - (a) storing the plurality of primitives in a plurality of bins;
  - (b) adjusting the capacity of one or more of the bins based on the ability of the system to process the primitives of a given bin in parallel;  
and
  - (c) rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.
13. A computer-readable medium containing a program for providing a graphical image on a display of a system, the graphical image being provided from data describing a plurality of primitives, the program including instructions for:
  - (a) storing the plurality of primitives in a plurality of bins;
  - (b) adjusting the capacity of one or more of the bins based on the ability of the system to process the primitives of a given bin in parallel; and
  - (c) rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.
25. A system for providing a graphical image on a display, the graphical image being provided from data describing a plurality of primitives, the system comprising:
  - a plurality of bins operable to store the plurality of primitives, wherein the capacity of one or more of the bins can be adjusted based on the ability of the system to process the primitives of a given bin in parallel; and
  - means for rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.

32. The method of claim 1 wherein step (b) comprises dynamically adjusting the capacity of one or more of the bins during operation of the system.

33. The method of claim 1 wherein step (b) comprises adjusting the capacity of one or more of the bins based on the number of primitives in a given bin and based further on the number of processors available to process the primitives.

34. A method for providing a graphical image on a display of a system, the graphical image being provided from data describing a plurality of primitives, the method comprising:

- (a) storing the plurality of primitives in a plurality of bins;
- (b) combining bins or portions of bins during operation of the system;

and

(c) rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.

35. The computer-readable medium of claim 13 wherein the instructions for adjusting the capacity of one or more of the bins during operation of the system comprise instructions for dynamically adjusting the capacity of one or more of the bins during operation of the system.

36. The computer-readable medium of claim 13 wherein the instructions for adjusting the capacity of one or more of the bins during operation of the system comprise instructions for adjusting the capacity of one or more of the bins based on the number of primitives in a given bin and based further on the number of processors available to process the primitives.

37. A computer-readable medium containing a program for providing a graphical image on a display of a system, the graphical image being provided from data describing a plurality of primitives, the program including instructions for:

- (a) storing the plurality of primitives in a plurality of bins;

- (b) combining bins or portions of bins during operation of the system;  
and
- (c) rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.

38. The system of claim 25 wherein the capacity of one or more of the bins can be dynamically adjusted during operation of the system.

39. The system of claim 25 wherein the capacity of one or more of the bins can be adjusted based on the number of primitives in a given bin and based further on the number of processors available to process the primitives.

40. A system for providing a graphical image on a display, the graphical image being provided from data describing a plurality of primitives, the system comprising:

- a plurality of bins operable to store the plurality of primitives, wherein the capacity of one or more of the bins can be adjusted during operation of the system;
- means for combining bins or portions of bins; and
- means for rendering the plurality of primitives by rendering each of the plurality of bins, bin by bin.

41. The system of claim 40 wherein the means for combining bins or portions of bins comprises means for combining bins or portions of bins based on the ability of the system to process the primitives of a given bin in parallel.

42. The system of claim 40 wherein the means for combining bins or portions of bins comprises means for combining bins or portions of bins based on the number of primitives in a given bin and based further on the number of processors available to process the primitives.

43. The method of claim 34 wherein step (b) comprises combining bins or portions of bins based on the ability of the system to process the primitives of a given bin in parallel.

44. The method of claim 34 wherein step (b) comprises combining bins or portions of bins based on the number of primitives in a given bin and based further on the number of processors available to process the primitives.

45. The computer-readable medium of claim 37 wherein the instructions for combining bins or portions of bins comprise instructions for combining bins or portions of bins based on the ability of the system to process the primitives of a given bin in parallel.

46. The computer-readable medium of claim 37 wherein the instructions for combining bins or portions of bins comprise instructions for combining bins or portions of bins based on the number of primitives in a given bin and based further on the number of processors available to process the primitives.



**EVIDENCE APPENDIX**

Not applicable.

**RELATED PROCEEDINGS APPENDIX**

The Appellant is unaware of any related appeals or interferences.